

COMPREHENSIVE MONTHLY REPORT

June 2018

**Dulles Corridor Metrorail Project
Phase 2
(Wiehle Avenue Station to Ashburn Station)**

Metropolitan Washington Airports Authority
Washington, DC

July 30, 2018
(Revised November 20, 2018)

PMOC Contract Number: DTFT60-14-D-00011

Task Order Number: 005, **Project Number:** DC-27-5331, **Work Order No.** 02

OPs Referenced: 01, 25

Hill International, Inc.

One Commerce Square

2005 Market Street, 17th Floor

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PMOC Lead: Mathew E. Trzepacz, [REDACTED]

Length of Time PMOC Assigned to Project: 4.5 years

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EXECUTIVE SUMMARY

The FTA and Project Management Oversight Contractor (PMOC) met with Metropolitan Washington Airports Authority (MWAA) on *July 10, 2018* to conduct the *Monthly Project Update Meetings* on Phase 1 and Phase 2 of the Locally Preferred Alternative (LPA) for the Dulles Corridor Metrorail Project. The Phase 2 project extends from the Wiehle Avenue Station in Fairfax County through Dulles International Airport to the Route 772 Station in Loudoun County. The PMOC plans to conduct future PMOC monthly progress meetings during the second week of each month.

1. Project Description

Phase 2 of the Project is an extension of Washington Metropolitan Area Transportation Authority (WMATA) heavy rail system and will provide 11.4 route miles of new track from the interim terminus at Wiehle-Reston East Station through Washington Dulles International Airport ("Dulles Airport") to a terminus in eastern Loudoun County. Phase 2 includes six new stations: Reston Town Center, Herndon, Innovation Center, Dulles Airport, Loudoun Gateway (Route 606) and Ashburn (Route 772) Stations. Phase 2 also includes a maintenance and storage yard facility at Dulles Airport, wayside facilities (including traction power substations, tiebreaker stations, and stormwater management ponds along the alignment), 5 new parking facilities with a total of 8,900 parking spaces, and sixty-four new railcars. The current Phase 2 project budget is \$2,778,235,564 exclusive of parking facilities and finance costs.

2. Project Status

MWAA announced on April 27, 2015 that they anticipated a delay of thirteen months to the Project. Change Order 066 granted the Package A Contractor 396 days of excusable delay which makes the revised Scheduled Substantial Completion Date (SSCD) August 7, 2019. *The latest Project Master Schedule through June 1, 2018 continues to indicate the contractual SSCD of August 7, 2019. The Package A Contractor's latest schedule through May 2018 shows a forecast Substantial Completion of September 4, 2019, representing 28 days of delay and was "Not Accepted" by MWAA. MWAA's Project Master Schedule indicates the Revenue Service Date (RSD) continues to be March 31, 2020.*

MWAA continues with close out activities for Phase 1. VDOT and MWAA continue to work toward resolution of the VDOT Punch List; MWAA met with DTP on December 14, 2016 to present the work that DTP is to complete. DTP accepted responsibility for about 30% of the listed items. [REDACTED]

[REDACTED] Bechtel, at a December 18, 2017 meeting with MWAA, agreed to repair all defective stormwater piping. MWAA reported the cost of these repairs will be funded jointly by Bechtel and MWAA. *MWAA submitted a draft schedule for VDOT repairs dated July 6, 2018 which will be updated on a monthly basis.*

MWAA reports the Task Order for the design of Old Meadow Road was negotiated, and cost of the final design is \$382,737. The Notice to Proceed was issued on March 20, 2017. ROW/Utility coordination meetings have been held, but Level 3 and AT&T utility companies have been slow to respond. At the June 4th QPRM, MWAA reported that the Level 3 conflict was minor and require hand excavation at one location. Old Meadow Road construction is expected to be completed in the *fourth*

quarter of 2018. The closeout of the FFGA is expected to occur in several years following payment of final Project costs with regard to the first 64 rail cars, which is expected to extend until 2021.

3. Core Accountability Information

TIFIA Core Accountability Items			
Project Status:		Original at TIFIA:	Current Estimate (EAC):
Cost	Cost Estimate	\$2,778,235,564	\$2,778,235,564
Contingency	Unallocated Contingency	\$551,451,179	\$324,572,235
	Total Contingency (allocated plus Unallocated)	\$551,451,179	\$324,572,235
Schedule	Revenue Service Date	1/31/19	3/31/2020
		Amount (\$)	Percent (of total)
Planned Value to Date	Total budgeted cost of work scheduled to date <i>(if available)</i>	\$2,132,916,697	87%
Earned Value to Date	Budgeted cost of work completed to date, i.e. actual total value of work earned or done <i>(if available)</i>	\$1,871,566,293	76%
Actual Cost	Total cost of work completed to date <i>(actual total expenditures)</i>	\$1,758,223,521	72%
Contracts		Amount (\$)	Percent
	Total contracts awarded to date	\$2,292,743,431	96%
	Total construction contract awarded to date (construction contracts only)	\$1,666,061,838	69%
	Physical construction work completed (amount of construction contract work actually completed)	\$1,248,790,593	75%
Major Issues	Status	Comments / Action / Planned Action	
1	SWM changes to Package A associated with 13 month delay.	Construction cost yet to be negotiated.	
2	Package B Design Delays, thru June 1, 2016	Global settlement 128 days. Cost yet to be finalized	
3	Airports Authority's Extended Management Cost (13 month delay)	Cost yet to be finalized	
4	Communications System Scope of Work – Fire Alarm and Intrusion Alarm systems separation.	Construction cost has been settled at (b) (5)	
5	Coordination of Package B and Package A interface	Package A has forecast interface supply dates up to three weeks behind Package B's need dates.	
Date of Next Quarterly Meeting (if known):		August 27, 2018	

4. Major Problems/Issues

1. Stormwater/Early Design Changes in Package A have resulted in a thirteen-month delay to the Project's construction substantial completion date to August 7, 2019. MWAA reported the thirteen-month delay claim was settled [REDACTED]
2. The additional construction costs related to the Stormwater/Early Design Changes and attendant increased overhead costs have yet to be finalized.
3. The Package A contractor has encountered harder rock than anticipated at some locations, which has forced the contractor to go to Directional Boring or hand mining rather than using a Jack and Bore Procedure. The contractor has redesigned the utility connections at stations to mitigate the impact.
4. The delays experienced by the Package A Contractor could have a negative schedule impact on the Package B Contractor, who will have to tie-in the Maintenance Yard tracks and systems to the mainline. Power has been fed to the Maintenance Yard.
5. In April 2017, Capital Rail Constructors (CRC) informed MWAA that during an audit of Universal Concrete Products, the manufacturer of architectural pre-cast panels, errors were found in moisture content sampling of the aggregates used. (b) (5)

[REDACTED]

On May 16, 2018, the Department of Justice (DOJ) unsealed their filing against Universal Concrete Products Corporation for violations of the False Claims Act. As part of the filing, the DOJ alleges that the aggregate being used in the concrete was from an unapproved quarry and failed to meet industry standard requirements, including alkali-silica reaction (ASR¹) testing. (b) (5)

[REDACTED]

A major open item in the close out of Phase 1 is the Virginia Department of Transportation (VDOT) punch list. Although Phase 1 went into revenue service on July 26, 2014, VDOT did not submit their final punch list until May 16, 2016. VDOT offered to perform the punch list work and developed a cost proposal in the amount of \$36.8 million to perform the work. [REDACTED]

[REDACTED] Meetings between the two parties have made progress in reaching a mutually agreeable resolution. VDOT and MWAA met with DTP on December 14, 2016, to present their scope of work that DTP needs to rectify. MWAA met with DTP on March 17, 2017, to discuss the deficiencies MWAA claims are DTP's responsibility. Bechtel, at a December 18, 2017 meeting with MWAA, agreed to repair all defective stormwater piping. MWAA reported the cost of these repairs will be funded jointly by Bechtel and MWAA. MWAA and Bechtel negotiated an agreement covering this work. *Construction began on July 2, 2018 and is expected take six months to complete. MWAA issued Task Order No. 46 requesting a cost proposal for a survey and study of the underdrain repairs coupled with sidewalk and ADA repairs.*

¹ASR is an expansive reaction that occurs over time in concrete between highly alkaline cement and the reactive non-crystalline (amorphous) silica found in common aggregates given sufficient moisture.

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MAIN REPORT

A. Project Status

Design Status

Final design and construction are being performed under DB contracts for Package A as well as for Package B. The designs of both Package A and Package B are 100% complete. Fairfax and Loudoun Counties are managing the final design of the parking facilities (formerly Package C). The Counties confirmed their commitment to deliver those elements as a condition precedent to receipt of their TIFIA loans.

Construction – Package A

As of January 1, 2017, MWAA reported all aerial substructure and support work had been completed. As of September 1, 2017, all the deck spans have been poured. Structural crews have set the pedestrian bridges at the Herndon, Reston Town Center, and Innovation Center Stations. *During June 2018, structures crews continue to finish painting girder bearings and performing general cleanup.*

Construction of track retaining walls and foundations continues in the Greenway median. Track wall openings for at grade access to the guideway continue to be formed and poured along the Greenway and DIAAH to close the guideway for track installation. The Contractor continues the relocation of the Dulles Toll Road (DTR) south of the Herndon Station for accessing the kiss and ride area and allowing the realignment of the DTR for Herndon Station. Traction power substations (TPSS) and tie-breaker stations (TBS) continue to be graded and paved. Screen wall foundations, columns and precast walls continue to be erected at the TPSS and TBS locations. The Innovation Station North sound wall is under construction.

Dominion Virginia Power (DVP) lines have been relocated and communications lines are being relocated to allow access to the west end of the existing Herndon Parking Garage from Sunrise Boulevard. Power and communication lines are being relocated to allow for the relocation of the Edmund Hailey Roadway south of the Reston Town Center Station Pavilion. All required testing and verification has been completed and power has been supplied from the Dominion substations via the 34.5kV distribution system to the Vista switches. Only TPSS #20 is without power. The installation of the 34.5kV cabling in the ductbank and manholes along the Project was completed. All cable has been installed, spliced and tested. All primary and secondary feeders have been tested and energized from the Dominion Energy substations to the Project.

Innovation Station - Electrical rough-in and plumbing work continues, along with detail work on the station and pavilion escalators and elevators. Construction at the South and North Pavilions continues, as does station touchup painting work in the station.

Herndon Station - Station platform pavers continue to be installed.as does mechanical and electrical rough in work. South Pavilion steel welding and painting continues. The adjacent property's cistern at the North Pavilion has been backfilled after the tie-in of some of the local stormwater pipes from the site.

Reston Town Center Station - South Pavilion structural steel welding and painting continued in June. Station roofing on the vault roof continues, as does mechanical and electrical rough-in work. North Pavilion construction continues with the detailing of the pedestrian bridges.

Dulles Airport Station – Station sanitary sewer and water lines have been tied-in to provide water and the adjacent storm sewers have been installed. Station lighting and HVAC duct work continue to be installed in the mezzanine ceiling.

Loudoun Gateway Station - Station precast and vault roof steel erection continues along with mechanical, electrical and plumbing rough-in work.

Ashburn Station - Roof work continues, as does mechanical, electrical and plumbing rough-in work. Elevator work escalator work continues in the station and in the North and South Pavilions. Work also continues with structural steel welding and detailing of the pedestrian bridges.

Rail and switches are being installed along the at-grade guideway in the DIAAH median through Herndon Station and Reston Station and along the Greenway median. Phase 1 tie-in rails have been installed and crews are finishing ballast tamping and profiling. Cables continue to be installed between TPSS #16 rooms and the aerial guideway at the Dulles Airport Station. TPSS #16 traction power equipment is being tested and cables are being terminated. Electricians continue pulling power and train control cables to the aerial and at-grade guideway from the TPSS and TBS locations and are installing jumper cables and bonds on the aerial track. Power and train control cables are being installed in cable troughs throughout the aerial guideway and along the at-grade guideway east beyond Herndon Station. Guideway mounted equipment for train control and switch operation continues to be installed on the aerial and at-grade ballasted guideway from Reston Station through the Yard leads. Electricians have energized 34.5kV feeder power to Vista switches at TPSS locations and station equipment continues to be tested. Final connection verification of this equipment is being done prior to applying power to the downstream equipment and facilities. Communications rooms are being equipped with racks and interconnecting cables are being installed and terminated.

Construction – Package B

As of the end of June 2018, work is continuing to progress on four major buildings in the Maintenance Facility. During the month, the Contractor continued installing ballasted and concrete embedded track and third rail in the lay-up yard. Work on the on-site gas line installation and sanitary force main remain on hold. Concrete pavement construction is ongoing and the installation of tanks also continued. The contractor has started the installation of site fencing.

Mechanical, electrical and plumbing work continued in the Service and Inspection Building (SIB). Drywall installation continued on the upper mezzanine, and the installation of the ceiling grid continued. The installation of equipment continued in the SIB.

Overhead mechanical, electrical, and plumbing rough-in and drywall framing continued on the first floor and upper mezzanine of the Maintenance of Way Building (MWB). The installation of tile started in June.

Mechanical, electrical and plumbing work continued on the first and second floors of the Transportation Police Building (TPB). Fire proofing began in June at the TPB. Mechanical, plumbing and electrical installation continued in the Warehouse Building (WB), as did interior painting. Roof installation started at the Train Wash Facility (TWF). Electrical work on TPSS #21 and TPSS #21A continued. The slab on grade for the Vehicle Storage Facility (VSF)s was placed.

The testing of switchgear and cabling continued throughout the site. The installation of switches, signal posts and insulated joints began in June 2018.

Procurement - Packages G and P

Package G (Dulles Airport Station Screen Wall) was re-advertised on May 10, 2018 and bids were received on June 21, 2018. Two proposals for Package G were received and the award will be on July 10, 2018. The pre-construction meeting with HGS, LLC for Package P (Stormwater Management Ponds) was held on June 14, 2018, and the substantial completion date is June 12, 2021. This contract includes two years of maintenance.

Parking Facilities (formerly Package C)

Fairfax County: Fairfax County is responsible for two parking facilities: one at the Innovation Center Station and one at the Herndon Station. Final design started in fall 2014. Project completion remains scheduled for April 30, 2019 for the Innovation Center Garage and is April 4, 2019 for the Herndon Station Garage. The project completions were previously revised by Fairfax County to accommodate the announcement by MWAA of a 13 month schedule delay.

The County's Department of Public Works and Environmental Services is the lead county agency for the design and construction of both parking facilities, and will be responsible for project management and oversight of both projects.

Herndon - Fairfax County received bids for the Herndon Station Parking Garage and awarded the contract to Manhattan Construction; the NTP was issued on October 31, 2016. The Herndon Garage project cost was revised to \$44.5 million from \$56.7 million based on the winning bid. Fairfax County had a formal groundbreaking for the Herndon Garage on November 30, 2016. The County received the contractor's detailed construction schedule on January 20, 2017. The Garage Bridge Erection (connection between the new and existing garage) was completed on November 26, 2017, and access to the site from Sunrise Valley Road was reopened on that date. *Construction is 87% complete. The focus is on interior work with both glazing and mechanical, electrical and plumbing work at 90% complete.*

Innovation Center - Notice to proceed was issued to Manhattan Construction on April 3, 2017. *Construction activities are ongoing with construction 62% complete with the continued erection of precast panels and plumbing and utilities work.*

Loudoun County: Loudoun County is responsible for three parking facilities: one at the Route 606 Station and two at the Route 772 Station.

The RFQ for the Ashburn South and Loudoun Gateway Garages was released on September 1, 2016 consistent with the County's schedule. Loudoun County is also coordinating with MWAA and WMATA regarding the garage fare collection.

Route 772 North (Ashburn North) – The Ashburn North Garage was constructed as a public privatization arrangement between Loudoun County and Comstock, LLP. Comstock was the developer of the Wiehle-Reston Parking Garage at the Phase 1 terminus.

Loudoun County reported the Final Comprehensive Agreement with Comstock was reached on September 9, 2015. Construction on the Ashburn North Garage began in January 2017, and

the construction was completed in January 2018. The certificate for non-residential occupancy was received and the garage opened at the end of April 2018. The Ashburn North Garage will be initially used for Comstock's commercial use, and will be open for Metrorail users at the start of revenue service. As stipulated in the Master Agreement, the temporary use will cease 180 days before the Phase 2 revenue service date. *The signage at Ashburn North Garage is in violation of the County'*

Route 772 South (Ashburn South) and Route 606 (Loudoun Gateway) – On May 2, 2017, the Loudoun County Board of Supervisors authorized the award of the Design Build contract for the design and construction of the Loudoun Gateway Garage (1,965 spaces) and Ashburn South Garage (1,540 spaces) to the S. B. Ballard Construction Company. Contract award was May 4, 2017, and the notice to proceed was issued on June 1, 2017. The substantial completion date for both garages is May 30, 2019. MWAA is the Authority Having Jurisdiction (AHJ) for the Ashburn South Garage, and Loudoun County is the AHJ for the Loudoun Gateway Garage. Loudoun County reports permits for the construction of both Ashburn South and Loudoun Gateway Garages have been obtained. Construction has begun on the installation of footings and drainage at Ashburn South. Installation of footings at Loudoun Gateway will begin as soon as rain ceases. Loudoun County and the Design-Build Contractor met with the fabricator of the external precast structure and all materials have been confirmed and fabrication has begun. The lease agreement with the Claude Moore Charitable Foundation for direct access to the Ashburn South site was signed on February 5, 2018 providing direct access to the site eliminating the intrusion into the Package Contractor's construction site. The 100% design has been approved. The scheduled completion date is May 31, 2019. However, the contractor has submitted a revised schedule which indicated about a two month delay and is being reviewed by the County. *The most recent schedule for the Loudoun Gateway Garage indicates that it is four and a half months behind the Ashburn South Garage. Loudoun County has not accepted this schedule.*

Loudoun County will prepare documents for a concessionaire to operate and maintain the Ashburn South and Loudoun Gateway Garages.

Real Estate Acquisition

The status of the Property Acquisitions through June 2018 is shown in the following table.

Property Acquisition Status

Priority	Total Anticipated ¹	PIP ² Complete	Initial Appraisal Complete ³	Revised PIP/ Appraisal Pending ⁴	Offer Made ⁵	Revision in Process	Settlement Reached/ Condemnation Processed ⁶	Acquisition Complete ⁷
1	9	9	9	1	9	0	8	8
2A	25	25 ⁸	22	1	22	0	19	17
2B	20	20 ⁹	20	0	20	2	17	12
Total¹⁰	54	54	51	2	51	2	44	37

Right of Entry (ROE) Status:

- Full Access for Construction provided for acquired parcels and Parcels 237, 228, 226, 336, 210, and 211. **Partial access provided for Parcel 268 in June 2018.**
- Full Access to Fairfax County-owned property was provided in 2013 for Parcels 213, 223, 232, 234, and 235.
- Full Access to Loudoun County-owned property was provided in 2016 for Parcels 257 and 258.

¹ Total based on current understanding.

² PIP = Property Identification Plan.

³ Initial appraisals complete for all Priority 1 Parcels 207, 214, 220, 237, 262, 255, 253, and 254. The appraisal for Parcel 258 is not needed since it was dedicated to Loudoun County prior to being made available to the Project. Appraisals complete for Priority 2 Parcels 231, 238, 240, 275, 276, 256, 320, 264, 271, 251, 266, 261, 228, 249, 260/360, 224, 259, 349, 208, 225, 209, 210, 357, 281, 225, 226, 211, 227, 212, 267, 263, 328, 252, 269, 358, 204, 205, 268, and 265. Appraisals for the dedicated parcels, Parcels 236, 336, 235, and 257 are not needed since the landowner is not subject to condemnation.

⁴ New appraisal required for Parcel 237 due to revised utility relocation and pier construction approach began in February 2018 based on revised PIP reflecting actual usage submitted in January. A revised appraisal is needed for Parcels 281 and 210 since the property owners have or will change prior to completion of the acquisition.

⁵ Offers made for Parcel 207, 220, 214, 238, 240, 237, 231, 262, 254, 275, 276, 253, 256, 320, 264, 271, 251, 266, 261, 228, 249, 255, 260/360, 224, 259, 349, 208, 209, 281, 227, 225, 226, 211 (June 2017), 210, 252, 269, 328 (including revision to Parcel 228), 263, 358, 357, 205, 204, 268, 212 and 267. Negotiations ongoing for Parcels 237, 226, 228, 328, and 268. Appraisal and offer revised for Parcels 228 and 226 (latter made in April 2018). Offers rescinded for Parcels 253 and 271 as the acquisition need for those parcels was eliminated. An offer is not required for Parcels 236, 336, 235, and 257. Condemnation package prepared and sent to VDOT for Parcels 207, 220, 320, 260/360, 249, 349, 210, 557, 269, and 268 due to impasse. Negotiations resumed with Parcels 210 and 268 prior to filing. **The offer related to Parcel 265 was presented in June 2018. The offer to the new owners for Parcel 210 was made in June 2018.**

⁶ Negotiations completed for Parcels 207, 214, 220, 240, 253, 231, 264, 276, 275, 238, 262, 320, 254, 256, 261, 236, 266, 251, 255, 271, 224, 349, 260/360, 235, 257, 258, 208, 209, 263, 225, 227, 357/557, 358, 252, 212, 267, 205, 204, 211, 269, and **268**. Condemnation package for Parcel 557 (part of 357 acquisition) was filed in December 2017. Agreement to process dedications for Parcel 336 and 259 were reached in May 2017 and July 2017, respectively. **Parcel 210's new owner has engaged in negotiations.**

⁷ Completed acquisitions: Parcels 207 (COT), 214, 220 (COT), 240, 231, 264, 276, 275, 238, 262, 320 (COT), 254, 256, 261, 266, 251, 255, 260/360 (COT), 258, 249 (COT), 349 (COT) 224, 263, 225, 269 (COT), 208, 227, 205, 209, 252, 259 and 204. Parcels 253 and 271 offers rescinded; no further action required. Parcels 236, 235, and 257 dedications completed.

⁸ Priority 2A PIP status: PIPs have been completed for all Priority 2A parcels. Parcels 240, 238, 231, 275, 276, 264, 320, 271, 256, 266, 251, 249, 265, 358, 236, 281, 336, 349, 252, 269, 328, 263, 308, 309, and 366. PIPs Accepted by MWAA. Parcel 236 completed as a proffered dedication. Parcel 336 is proceeding as a proffered dedication.

⁹ Priority 2B PIP status: PIPs have been completed for all Priority 2B parcels. MWAA Accepted PIPs for Parcel 261, 228, 260/360, 259, 224, 257, 357, 235, 225, 226, 212, 267, 211, 208, 209, 210, 227, 204, 205, and 268.

¹⁰ Does not include those parcels on which construction will be performed by permit/permission (TRIP II and Fairfax County). Acquisitions/conveyances will be based on as-built conditions and completed prior to Substantial Completion.

Third Party Agreements

Six Intergovernmental Agreements are required for Phase 2:

The status of the six agreements is summarized in the next table.

AGREEMENT	STATUS	NOTES
WMATA – New Agreement	Executed on August 7, 2013	Effective date August 7, 2013
VDOT – Amendment of Phase 1 Agreement	Executed on November 4, 2013	Effective date November 4, 2013
Fairfax County – Amendment of Phase 1 Agreement	Executed on May 28, 2013	Effective date May 28, 2013
Loudoun County	Executed on August 7, 2013	Effective date August 7, 2013
Town of Herndon	Executed on July 9, 2013	Effective date July 9, 2013
TRIP II (Dulles Greenway)	Executed on September 30, 2013	Effective date August 1, 2013
Local Funding Agreement with VDOT for Route 606 improvements	Executed on June 11, 2014	Work was added to the design plans prior to execution of the agreement.

National Environmental Policy Act (NEPA)

MWAA prepared an Environmental Assessment covering the preliminary engineering design refinements for Phase 2, and issued it for public review on May 10, 2012. The FTA Regional Administrator issued a Finding of No Significant Impact (FONSI) on December 17, 2012, that stated there were “no significant environmental or socioeconomic impacts associated with the design refinements for Phase 2 of the Dulles Corridor Metrorail Project.” FTA cautioned that should there be any changes in the location of the parking facilities by the counties, or if they need any additional property for the construction of the parking facilities, MWAA must notify FTA immediately to determine if the environmental documents would need revisions.

On April 24, 2015, MWAA submitted a letter regarding the environmental re-evaluation for the DCMP Phase 2 parking garage refinements to the FTA on June 4, 2015. FTA’s concurrence letter dated August 10, 2015 was received on August 11, 2015.

MWAA last updated their Summary Matrix of Environmental Mitigation Measures to FTA on April 27, 2018 for the first quarter of 2018.

B. Project Management Plan (PMP) and Sub-plans

MWAA has submitted the PMP and required sub-plans. Below is the status of each plan received by FTA through *May 31, 2018*.

PMP Final Version 2.2 was submitted to the FTA on January 31, 2017; and PMOC recommended the FTA approve the document with comments on February 8, 2017. FTA

approved the Project Management Plan Final Version 2.2 with comments on April 6, 2017. The draft update of the PMP, Version 3.0 was submitted on March 30, 2018 and PMOC submitted its review comments to MWAA on May 8, 2019. (b) (5)

MWAA submitted the revised Draft PMP on June 28, 2018, and is under review by the PMOC.

Quality Program Plan (QPP), Revision 1, was approved by FTA on September 23, 2013 and FTA requested that MWAA update it as needed as Phase 2 continues to move forward through final design and construction.

Safety and Security Management Plan (SSMP), Revision 2 dated February 29, 2016 was approved by FTA on August 8, 2017.

Risk and Contingency Management Plan (RCMP) - MWAA submitted the Final RCMP, Revision 3.0 on January 22, 2018. PMOC had a few comments which MWAA incorporated into the RCMP on February 1, 2018. PMOC recommended FTA approve the RCMP on February 5, 2018. FTA approved the RCMP, Revision 3.0 on March 6, 2018.

WMATA’s Rail Fleet Management Plan (RFMP), Revision 5a was submitted and PMOC provided comments on January 12, 2017. WMATA expects to submit a revised RFMP in early 2018.

C. Project Management Capacity and Capability

(b) (5)

As of June 2018, fifteen full time equivalents were working on Phase 1 which is two less than the May 2018 actual headcount.

MWAA reported the estimated number of full-time equivalents for Phase 2 during June 2018 is 1,395, a decrease of 228 from the May actual count. The estimated June 2018 numbers are indicated in the table below.

MWAA	37
Virginia Department of Rail and Public Transportation (DRPT)	1
Virginia Department of Transportation (VDOT)	4
Washington Metropolitan Area Transportation Authority (WMATA)	35
Project Management Support Services	134.3
Capital Rail Constructors (CRC) – Package A	829
Hensel Phelps Construction Company (HPCC) – Package B	355
Total	1,395

- **Project Controls**

MWAA has developed project management procedures with regard to monitoring and controlling project scope, quality, schedule, cost, contingency management, and safety. MWAA is to update the PMP by January 31, 2017, which it did. PMOC recommended that FTA approve PMP Final Version 2.2 on February 8, 2017. FTA approved PMP Version 2.2 on April 6, 2017. (b) (5)

- **Compliance** (b) (5)

- **Disadvantaged Business Enterprise (DBE) Goal** – MWAA developed a DBE Project Goal of 25% of the federal participation cost for Phase 2, which the FTA’s Region 3 Civil Rights Officer reviewed, and subsequently approved on August 26, 2013.

- MWAA continues to review and verify Scheduled DBE participation (Contracts Awarded) and Actual DBE participation (Payments). The following table details DBE Goals, DBE contracts awarded and DBE participation achieved through the last assessment *May 30, 2018*. Dollar values are included for the latest assessment period.

PRIME CONTRACTS	DBE GOAL %	DBE CONTRACTS AWARDED (DBE/TC)	NEW DBE AWARDS MAY 2018	DBE CONTRACTS AWARDED TOWARD GOAL	DBE GOAL ACHIEVED (DBE Pmts/TC)	DBE PAYMENTS MAY 2018
PreEng - PRELIMINARY ENGINEERING	0%	15.77%	\$0	N/A	15.77%	\$0
PMSS - RAIL OFFICE	25%	24.95%	\$0	99.82%	20.46%	\$1,094,882
PKG A - DESIGN BUILD CONTRACT	14%	15.72%	\$0	112.26%	8.77%	\$28,125
PKG B - RAIL YARD AND MAINTENANCE FACILITY	14%	14.81%	\$1,606	105.79%	9.81%	\$1,489,035
PKG S - SOIL STOCKPILE RELOCATION	25%	37.53%	\$0	150.11%	21.49%	\$0
PSI - SPECIAL INSPECTION SERVICES	15%	18.44%	\$200,000	108.72%	14.93%	\$82,038
ROW - REAL ESTATE ACQUISITION	25%	25.00%	\$0	100.00%	9.32%	\$0
CHANGE ORDER & CLAIM STATUS	15%	12.22%	\$0	81.48%	12.22%	\$6,750
TOTALS			\$ 201,606			\$ 2,700,830

- **Davis-Bacon Act Verification** – MWAA is reporting Davis-Bacon Act verification activities in the Monthly Progress Report. As of the *May 2018* MWAA Monthly Progress Report, DBA compliance monitoring is ongoing including the review of certified payroll reports and Prime Contractor requests to add additional job classifications and wage rates.

D. Project Cost

MWAA’s Phase 2 project budget was \$3,126,450,757, including the cost of the parking facilities funded by Fairfax and Loudoun Counties. This figure is in year-of-expenditure dollars and excludes the finance costs. With the commitment from both Fairfax and Loudoun Counties to fund and procure the parking facilities independently, MWAA has revised its Phase 2 project budget to \$2,778,235,564. This is a deduction of \$348,215,194, which includes associated primary and secondary mitigation for the parking facilities. The SCC budget and expenditure summary for the period ending *May 31, 2018* is shown below. As of *May 2018*, project expenditures total \$1,758,223,521. Based on the budget and expenditures, the total project completion is 72%. This percentage does not include finance charges and contingency.

Dulles Corridor Metrorail Project - Phase 2

All Packages Cost Summary by SCC Code, May 2018

FTA SCC CODE	DESCRIPTION	ORIGINAL BUDGET ¹	BASELINE BUDGET ²	EXPENDITURE IN MAY	EXPENDITURE TO DATE ⁴	ESTIMATE AT COMPLETION ⁵	CONTINGENCY TO DATE
10	Guideway and Track Elements	\$ 344,946,326	\$ 167,928,670	\$ 1,181,910	\$ 178,109,889	\$ 204,337,734	\$ 4,657,034
20	Stations	\$ 228,424,057	\$ 227,697,000	\$ 3,478,218	\$ 130,926,363	\$ 225,360,747	\$ 15,115,061
30	Yards, Shops, Administration Buildings	\$ 229,857,097	\$ 213,730,843	\$ 5,610,135	\$ 168,264,136	\$ 227,311,898	\$ 12,007,055
40	Site Work and Utility Relocation	\$ 394,075,868	\$ 545,160,692	\$ 4,512,223	\$ 518,398,176	\$ 697,507,729	\$ 155,769,512
50	Systems	\$ 193,794,178	\$ 215,516,247	\$ 3,437,672	\$ 119,514,952	\$ 221,196,733	\$ 16,041,586
60	Right of Way Acquisition	\$ 58,523,267	\$ 58,600,000	\$ 88,362	\$ 22,585,372	\$ 58,003,200	\$ -
70	Vehicles	\$ 212,765,000	\$ 213,613,334	\$ 17,557	\$ 133,725,454	\$ 212,055,334	\$ -
80	Professional Services	\$ 564,398,592	\$ 574,696,366	\$ 6,874,156	\$ 486,699,178	\$ 607,890,953	\$ 33,130,929
90	Contingency ³	\$ 551,451,179	\$ 561,292,412	\$ -	\$ -	\$ 324,571,235	\$ (236,721,177)
TOTAL PROJECT COST		\$ 2,778,235,564	\$ 2,778,235,564	\$ 25,200,233	\$ 1,758,223,521	\$ 2,778,235,564	\$ -

1 Original Budget is based on Table 2-1 "Program Budget Breakdown" of RCMP Rev1c submitted to FTA in November 2013

2 Baseline Budget reflects cost loading of Package A baseline schedule approved in February 2014 and redistribution of spare parts budget Baseline Budget for Packages B and S is adjusted to matched the Contract Price Baseline Budget for Contingency is adjusted by \$9.8 million increase which is the net of the underrun in Package S and overrun in Package B

3 All of the contingency resides in SCC 90

4 Package A expenditure to date includes \$5 million of retainage released in December 2014 Excludes \$8.2 million in Betterments

5 Estimate at Completion includes Baseline Budget plus any changes funded via contingency drawdown requests and budget transfer requests Excludes \$11.8 million in Betterments

6. Package P awarded on June 14, 2018 is being funded from contingency.

On May 14, 2013, MWAA awarded the Package A Contract for final design and construction of the line and stations in the amount of \$1,177,777,000. This was \$307.6 million below the engineer's estimate, which did not take into account the Insurance line item that was deleted from the contract award amount. In April 2014, MWAA redistributed the SCC budgets to reflect the cost-loaded Final Baseline Schedule for Package A and in April 2015 the SCC budgets were redistributed to reflect the cost-loaded Final Baseline Schedule for Package B.

As of May 2018, Contingency Drawdown Requests (CDR) totaling \$200,293,783 have been issued. This includes a contribution to Contingency of \$9,841,233 due to balance of the under run for Package S and the overrun in Package B.

The following are the expenditures through May 2018 by SCC for each of the contract packages. Both Package A and Package B continue to lag the planned performance levels. Both CRC (Package A) and HPCC (Package B) need to increase their staffing levels to meet the Contractual Substantial Completion Dates.

Package A Cost by SCC – May 2018

Dulles Corridor Metrorail Project - Phase 2

Package A Project Cost Summary by SCC Code

FTA SCC CODE	DESCRIPTION	ORIGINAL BUDGET ¹	BASELINE BUDGET ²	EXPENDITURE IN MAY	EXPENDITURE TO DATE ³	ESTIMATE AT COMPLETION ⁴	CONTINGENCY TO DATE
10	Guideway and Track Elements	\$ 340,953,449	\$ 163,928,670	\$ 1,181,910	\$ 178,109,889	\$ 200,337,734	\$ 4,657,034
20	Stations	\$ 224,432,514	\$ 223,697,000	\$ 3,478,218	\$ 130,926,363	\$ 221,360,747	\$ 15,115,061
30	Yards, Shops, Administration Buildings	\$ 377,285	\$ -	\$ -	\$ -	\$ -	\$ -
40	Site Work and Utility Relocation	\$ 352,759,752	\$ 509,201,330	\$ 4,410,881	\$ 494,788,162	\$ 626,692,140	\$ 121,006,480
50	Systems	\$ 172,044,132	\$ 188,997,000	\$ 3,437,672	\$ 119,255,496	\$ 194,677,486	\$ 16,041,586
60	Right of Way Acquisition	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
70	Vehicles	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
80	Professional Services	\$ 87,209,868	\$ 91,953,000	\$ -	\$ 111,527,325	\$ 114,591,317	\$ 22,465,463
90	Contingency	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOTALS		\$ 1,177,777,000	\$ 1,177,777,000	\$ 12,508,681	\$ 1,034,607,236	\$ 1,357,659,424	\$ 179,285,624

1 Original Budget is based on Table 2-1 "Program Budget Breakdown" of RCMP Rev1c submitted to FTA in November 2013

2 Baseline Budget reflects cost loading of Package A baseline schedule approved in February 2014 and redistribution of spares parts budget This reflects the original contract amount

3 Expenditure to date includes \$5 million of retainage released in December 2014 Excludes \$8.2 million in Betterments

4 Estimate at Completion includes Baseline Budget plus any changes funded via contingency drawdown requests and budget transfer requests Excludes \$11.8 million in Betterments

Package B Cost by SCC – May 2018

Dulles Corridor Metrorail Project - Phase 2

Package B Project Cost Summary by SCC Code

FTA SCC CODE	DESCRIPTION	ORIGINAL BUDGET ¹ ³	BASILINE BUDGET ²	EXPENDITURE IN MAY	EXPENDITURE TO DATE	ESTIMATE AT COMPLETION ⁴	CONTINGENCY TO DATE
10	Guideway and Track Elements	\$ -	\$ -			\$ -	
20	Stations	\$ -	\$ -			\$ -	
30	Yards, Shops, Administration Buildings	\$ 202,977,283	\$ 201,238,645	\$ 5,610,135	\$ 162,599,349	\$ 214,394,200	\$ 11,509,555
40	Site Work and Utility Relocation	\$ 25,772,661	\$ 23,296,613	\$ 101,342	\$ 19,057,457	\$ 31,417,346	\$ 8,027,537
50	Systems	\$ -	\$ 2,772,451		\$ 230,850	\$ 2,772,451	
60	Right of Way Acquisition	\$ -	\$ -			\$ -	
70	Vehicles	\$ -	\$ 1,558,000			\$ -	
80	Professional Services	\$ 20,530,586	\$ 24,123,291	\$ 16,909	\$ 25,845,388	\$ 27,696,355	\$ 3,682,260
90	Contingency	\$ -	\$ -			\$ -	
TOTALS		\$ 249,280,530	\$ 252,989,000	\$ 5,728,386	\$ 207,733,044	\$ 276,280,352	\$ 23,219,352

1 Original Budget is based on Table 2-1 "Program Budget Breakdown" of RCMP Rev 1c submitted to FTA in November 2013

2 Baseline Budget reflects cost loading of Package B baseline schedule approved in March 2015 This reflects the original contract amount

3 Original Budget includes \$500,000 for the Route 606 improvements at Rail Yard that is now performed outside Package B

4 Estimate at Completion includes Baseline Budget plus any changes funded via contingency drawdown requests and budget transfer requests

Through June 2018, approved change orders totaled \$150,492,265 for Package A, which is the same as the May 2018 total. The change orders in process in June 2018 total \$40,486,836, and 59 Requests for Change (RFC) are under evaluation totaling approximately \$31,404,739 in Contractor proposals for Package A. In addition, MWAA has approved change orders for Package B that total \$21,699,352. In June 2018, change orders in process total \$450,500 and 23 Requests for Change (RFC) under evaluation total \$11,831,772. This charge against contingency represents a total of \$256,365,464 or 45.67% of the total Project Contingency of \$561,292,412 at a point where overall Project completion is at 72%.

The total charges against the Project are summarized below.

Dulles Corridor Metrorail Project - Phase 2
Monthly Cost Report, May 2018

DESCRIPTION	ORIGINAL BUDGET	BASELINE BUDGET ^{3,5}	EXPENDITURE TO DATE ⁴	ESTIMATE AT COMPLETION ⁶	PERCENT OF EAC EXPENDED TO DATE
Design-Build					
Design Build Main Line - Package A	\$ 1,177,777,000	\$ 1,177,777,000	\$ 1,034,607,236	\$ 1,357,659,424	
Commodity Escalation - Package A	\$ 16,000,000	\$ 16,000,000	\$ -	\$ 16,000,000	
Yard - Package B + Yard Soil Preparation - Package S	\$ 269,280,530	\$ 258,939,297	\$ 214,183,358	\$ 282,730,666	
Commodity Escalation - Package B	\$ 4,000,000	\$ 4,000,000	\$ -	\$ 3,928,000	
Design-Build Contracts Total	\$ 1,467,057,530	\$ 1,456,716,297	\$ 1,248,790,593	\$ 1,660,318,090	75%
Right of Way					
Parcels & Project Management	\$ 58,600,000	\$ 58,600,000	\$ 22,585,372	\$ 58,003,200	
Right Of Way Total	\$ 58,600,000	\$ 58,600,000	\$ 22,585,372	\$ 58,003,200	39%
WMATA Agreement					
Vehicles	\$ 205,868,200	\$ 205,868,200	\$ 133,725,454	\$ 205,868,200	
WMATA Non Revenue Vehicles	\$ 9,250,751	\$ 9,620,781	\$ 3,008	\$ 9,620,781	
WMATA Project Management and Other Costs	\$ 90,205,767	\$ 89,835,737	\$ 30,009,797	\$ 89,835,737	
WMATA Agreement Total	\$ 305,324,718	\$ 305,324,718	\$ 163,738,260	\$ 305,324,718	54%
Preliminary Engineering					
Preliminary Engineering Total	\$ 75,000,000	\$ 75,000,000	\$ 73,266,056	\$ 75,000,000	98%
Airports Authority Services					
Airports Authority Project Management	\$ 64,620,000	\$ 64,620,000	\$ 52,654,941	\$ 66,471,913	
Project Management Support	\$ 140,000,000	\$ 140,000,000	\$ 143,186,586	\$ 140,560,000	
Other Costs ¹	\$ 116,182,137	\$ 116,682,137	\$ 54,001,713	\$ 121,400,247	
Airports Authority Services Total	\$ 320,802,137	\$ 321,302,137	\$ 249,843,239	\$ 328,432,160	76%
Contingency					
Contingency Total	\$ 551,451,179	\$ 561,292,412		\$ 324,571,235	
Dulles Airport Windscreens - Package G⁷					
Dulles Airport Windscreens Total	\$ -	\$ -		TBD	
Stormwater Management Ponds - Package P⁸					
Stormwater Management Ponds Total	\$ -	\$ -		\$ 26,586,161	
TOTAL PROJECT COSTS	\$2,778,235,564	\$2,778,235,564	\$1,758,223,521	\$2,778,235,564	72%²

1 Includes Rent, Relocation, OCIP, VDOT, Dulles Rail Consultants, Testing Consultant, DGS, TRIP II, DEQ, Airports Authority Permits/Inspection, Testing Power and Historic/Archaeological Mitigation Estimate at Completion includes Dominion Virginia Power Route 28 to Frying Pan Road Ductbank Installation also

2 This percentage does not include Contingency

3 Baseline Budget for Package A, B and S reflects the Contract Price Baseline Budget for Contingency is adjusted by \$9.8 million increase which is the net of the underrun in Package S and overrun in Package B

4 Package A expenditure to date includes \$5 million of retainage released in December 2014 Excludes \$8.2 million in Betterments

5 Baseline Budget for WMATA Agreement is adjusted to align with WMATA's distribution of original budget in invoice #2

6 Estimate at Completion includes Baseline Budget plus any changes funded via contingency drawdown requests and budget transfer requests Excludes \$11.8 million in Betterments

7 Package G will be funded from Contingency and should not have any impact on the Total Project Costs

8. Package P awarded on June 14, 2018 is being funded from contingency.

Funding Sources

Primary funding for Phase 2 (excluding parking facilities) comes from *Congestion Mitigation Air Quality (CMAQ) Grant (0.40%)*, MWAA (8.40%), Fairfax County (18.57%), Loudoun County (9.83%), Commonwealth of Virginia (11.64%), Dulles Toll Road (49.01%), and the Northern Virginia Transportation Authority (2.16%). *The CMAQ Grant was awarded in May 2018.* The Northern Virginia Transportation Authority funding of \$60 million is to be used to fund just the construction of the Innovation Station and was awarded in October 2015 and May 2016. MWAA, Fairfax County, and Loudoun County received a total of \$1.876 billion in direct loans under the United States Department of Transportation (USDOT) Transportation Infrastructure Finance and Innovation Act (TIFIA) credit assistance program to assist in financing their shares.

Funding Source	Phase 2 Funding*	Percentage of Total
Commonwealth of Virginia	\$ 323,300	11.64%
Northern VA Transportation Authority	\$ 60,000	2.16%
Congestion Mitigation Air Quality (CMAQ) Grant (awarded)	\$ 7,401	0.40%
CMAQ (to be awarded)	\$ 3,668	
Fairfax County	\$ 515,910	18.57%
Loudoun County	\$ 273,066	9.83%
MWAA (Aviation Funds)	\$ 233,244	8.40%
MWAA (Dulles Toll Road)	\$ 1,361,647	49.01%
Total Sources of Funding	\$ 2,778,236	100.00%

* In \$1,000

TIFIA Funding Status

On August 20, 2014, United States Department of Transportation (USDOT) Transportation Infrastructure Finance and Innovation Act (TIFIA) credit assistance program executed a loan with MWAA, not to exceed \$1.278 billion to assist in financing its share. The TIFIA Loan with Loudoun County for up to \$195 million closed on December 9, 2014 and the TIFIA Loan with Fairfax County for up to \$403 million closed on December 17, 2014. The US Department of Transportation has provided \$1.876 billion in TIFIA Loans to support the construction of Phase 2. As of August 2014, this represents the largest TIFIA assistance for a single project in the program's history. MWAA submitted their Recovery Plan on August 11, 2016 which was accepted by FTA on October 3, 2016. The Recovery Plan reflected the thirteen month delay to the Project. MWAA submitted their 2017 TIFIA Financial Plan and associated Revised Financial Model of the Project on March 30, 2017. The 2018 TIFIA Financial Plan was submitted on March 30, 2018.

E. Project Schedule

Phase 2 is currently in the design/construction phase. Construction began on Package A in June 2014 with the start of utility relocation. The commencement of revenue service is to begin on March 31, 2020, according to the last accepted overall Program Schedule. Since MWAA announced on April 27, 2015 that the Project was incurring a thirteen month delay, a revised baseline schedule has been submitted. Revised Project Milestones are updated based on the accepted-as-noted Package Revised Baseline Schedule in May 2015.

The table below shows the Phase 2 milestones as noted in the *June 1, 2018 Project Master Schedule* dated *July 3, 2018*, as provided by MWAA. *These dates are based on CRC's May 2018 Monthly Schedule Update which was "Not Accepted" by MWAA. CRC's May 2018 Schedule Update reflects a 28 day delay to the Project Contractual Substantial Completion Date of August 7, 2019.*

DULLES CORRIDOR PHASE 2 MILESTONES	
DESCRIPTION	DATE
Package A – Design-Build Contract Award	05/14/2013(A)
Package S – Advanced Earthwork Contract IFB	06/27/2013 (A)
Package A – Contract NTP	07/08/2013(A)
Package S – Advanced Earthwork Contract Award	11/01/2013 (A)
Package S – Advanced Earthwork Contract NTP	11/18/2013 (A)
Package B – Contract RFQI	11/12/2013 (A)
Package B – Contract RFP	02/11/2014 (A)
Loudoun County Garages – Board Action on BAFOs	06/10/2014 (A)
Package B – Contract Award	07/29/2014 (A)
Package A – Start of Construction	June 2014 (A)
Fairfax County – Approval of Land Use Cases for Parking Facilities	07/29/2014 (A)
Package B – Contract NTP	08/18/2014 (A)
Package S – Advanced Earthwork Contract Substantial Completion	12/08/2014(A)
Deadline for Fairfax and Loudoun Counties' decision to construct the Parking Facilities	12/29/2014(A)
Fairfax County – Design of Parking Facilities Complete	11/30/16 (A)
Loudoun County – Design for RFP of Parking Facilities Complete	01/04/17 (A)
Package A – Complete Design	10/19/18
Package A – Complete Aerial Guideway Structure Construction	08/31/18
Package A – Complete At-Grade Guideway Structure Construction	07/09/18
Package A – Complete Station Build-out	07/29/19
Package A – Complete Systems Installation	07/23/19
Fairfax County – Construction of Parking Facilities Complete	05/31/19
Loudoun County - Construction of Parking Facilities Complete	10/16/19
Package A – Forecasted Substantial Completion	09/04/19
Package B - Complete Yard Systems and Commissioning	04/22/19
Package B – Forecasted Substantial Completion	09/07/19
Complete WMATA Operations Readiness Testing	11/03/19
Complete WMATA Revenue Operations Acceptance Testing	03/03/20
Revenue Service Date (RSD)	03/31/20
Project Final Acceptance	06/30/20

Critical Path

CRC's Primary Critical Path as reflected in their *May 2018* schedule update runs through *the installation of ATC Intrusion Detection System in the East and N11 segments, followed by dynamic testing in the west. MWAA did "Not Accept" this schedule update representing 28 days delay to the Project completion.*

Important Activities – 90-Day Look Ahead

- *CRC to complete construction of the Aerial and At-Grade Guideway Structures.*

F. Quality Assurance/Quality Control

The Quality Management Plan, Revision 1, submitted by CRC was approved in January 2014. MWAA added that it has requested the QC plans be submitted from the CRC subcontractors and vendors. *CRC is submitting inspection test plans for MWAA review.*

During June 2018, no surveillances or audits were performed on Package A.

MWAA typically submits a rolling six month Audit Schedule at each monthly update meeting. *The most recent QA Audit Schedule for July 2018 through December 2018 for Package A is shown below from the July 10, 2018 monthly update meeting.*

DULLES CORRIDOR METRORAIL PROJECT
Phase 2, Package A
QA Audit and Surveillance Schedule
July 2018 through December 2018

Tentative Date	Audit (A) Surveillance (S)	Organization/Activity	Joint Audit/ Surveillance	Lead
7/12/18	A	Mass Electric	N	MWAA
8/25/18	A	CRC's MOT Audit	N	MWAA
9/20/18	A	CRC Right of Way Acquisition	N	MWAA
11/15/18	A	CRC Construction Safety and Security Plan	N	MWAA
12/13/18	A	CRC Survey Audit	N	MWAA

During June 2018, MWAA performed an audit of the Hensel Phelps Contract Drawing Maintenance. The most recent QA Audit Schedule for Package B is shown below.

DULLES CORRIDOR METRORAIL PROJECT
Phase 2, Package B
QA Audit and Surveillance Schedule
July 2018 through September 2018

Tentative Date	Audit (A) Surveillance (S)	Organization/Activity	Joint Audit/ Surveillance	Lead
6/19/18	S	M.C.Dean Quality Documents	Y	MWAA/HP
8/15/18	S	Post Installation Checkout Testing	Y	MWAA/HP

G. Safety and Security

Construction Safety and Security – The contractor’s safety performance reports, including the accident/injury statistics, are included in the MWAA Monthly Progress Reports. However, the

PMOC requested the Accident/Injury Statistics be provided by the fifteenth of each month, ahead of each monthly progress meeting. As of *June 2018*, CRC has recorded 6,688,593 hours worked with 231 first-aid cases, 37 OSHA recordable cases of which two resulted in lost time, 225 incidents, 42 utility hits, five environmental spills, 26 vehicular accidents, 30 property damage claims (>\$1500), and six lost time days. *Seven first aid cases, 21 incidents, two utility hits, one vehicular accident and six property damage claims occurred during June 2018.*

HPCC has recorded 1,452,626 hours worked with thirteen OSHA recordable (non-lost time) cases, one OSHA Recordable (lost time) case with twenty-eight lost time days, sixteen first-aid cases, one vehicular accident and 79 incidents. There were two Incident Investigations, one first aid case and one OSHA Recordable Case (Non-Lost Time) during June 2018.

Safety and Security Working Group (SCWG) is the entity charged with the development of Design and Construction Conformance criteria, checklists and hazard analysis for the Project. This group meets on a monthly basis and continues to function satisfactorily. WMATA is responsible for the Threat and Vulnerability Analysis and has hired their consultant for this work. WMATA has completed the review of the Phase 2 design against the existing Silver Line and Yard TVAs, and has not informed MWAA of any issues requiring resolution.

H. Americans with Disabilities Act (ADA)

There have been no ADA issues reported to date. The design of the Project is ADA compliant.

I. Buy America

There have been no Buy America issues to date.

J. Vehicle Technology

The Project is acquiring 64 new rail cars which are part of WMATA's 7000 Series Rail Car Procurement. Earlier, MWAA procured 64 7000 Series Rail Cars for Phase 1. The monitoring of the rail car procurement is being done under the WMATA PMOC oversight. The production of the Phase 2 rail cars began in February 2017. The 64th railcar was conditionally accepted on October 13, 2017.

Project Risks

The Final RCMP, Revision 3.0 was submitted on February 1, 2018, and the PMOC recommended FTA approval on February 5, 2018. FTA approved the RCMP, Revision 3.0 on March 6, 2018.

Budget Risks: MWAA allocated \$551 million in contingency for the overall project. A contingency management plan has been established for the release of contingency based on contract milestones.

Schedule Risks: The result from MWAA’s original schedule risk analysis showed that there is less than five percent chance that the Schedule Substantial Completion Date (SSCD) would take place on July 7, 2018. The 80% confidence level date for the SSCD is December 6, 2018, indicating a hypothetical delay of 152 calendar days. The schedule risk analysis performed by the project team was limited to the SSCD. For the Revenue Service Date (RSD), the project team has accepted the recommendation by PMOC to include a time contingency of 14 months in the overall program schedule. Overall, the schedule contingency, including the WMATA testing through the Revenue Service Date, is 14 months. With MWAA’s announcement on April 27, 2015 that the Project had incurred a thirteen month delay, essentially all the *original* forecast Project Schedule Contingency (14 months) has been consumed. Analysis performed on the revised baseline schedule with 13 months of extension and actual progress to date revealed that ten months of additional schedule contingency would suffice.

Action Items

MWAA – DULLES CORRIDOR METRORAIL PROJECT PHASE 2- Items for Grantee Action

PR	ITEM	IDENTIFICATION	NATURE of PROBLEM	D	A	I	COMMENTS	STATUS
2	2A	MWAA to update PMP.	PMP Version 3.0 should be reviewed and updated.	N	N	N	MWAA submitted Draft PMP, Version 3, to FTA on March 30, 2018. PMOC submitted comments to MWAA on May 8, 2018. MWAA submitted the revised draft on June 28, 2018, which is under review.	R

KEY ITEM Note– Items marked with a ‘C’ in the ‘PMO Contractor Status’ column will be dropped from future reports.

Subtask 2A CLIN 0002A – PMP Review
 Subtask 2B CLIN 0002 – On-Site Monitoring

LEGEND

PRIORITY (PR)

1- Most Critical
 2- Critical
 3- Least Critical

GRANTEE ACTION

D – Remedial Action Developed
 A – Remedial Action Approved
 I – Action Implemented

PMO CONTRACTOR STATUS

R – Review On-going
 C – Completed – No further review required

APPENDICES

APPENDIX A – LIST OF ACRONYMS

ACMC	Atlantic Contracting and Material Company
AHJ	Authority Having Jurisdiction
Airport	Dulles Airport
AUP	Agreed Upon Procedures
BAFO	Best and Final Offer
BMP	Best Management Practices
Board	MWAA Board of Directors
CA	Conditional Acceptance (7K Railcars)
CDR	Contingency Drawdown Requests
CPSM	Construction and Professional Services Manual (Commonwealth of Virginia)
CRC	Capital Rail Constructors
DB	Design-Build
DBE	Disadvantaged Business Enterprise
DBOM	Design-Build-Operate-Maintain
DBOM+F	Design-Build-Operate-Maintain-Finance
DCMP	Dulles Corridor Metrorail Project
DCR	Design Change Request
DE	Dominion Energy
DEQ	Department of Environmental Quality
DHR	Department of Historical Resources
DIAAH	Dulles International Airport Access Highway
DIDB	Disparate Impact and Disproportionate Burden
DRPT	Department of Rail and Public Transportation (Virginia)
DTP	Dulles Transit Partners, LLC
DTR	Dulles Toll Road
DVP	Dominion Virginia Power (now called Dominion Energy)
EA	Environmental Assessment
EPDM	Ethylene Propylene Diene Terpolymer (roofing system)
FIA	Fire and Intrusion Alarm
FONSI	Finding of No Significant Impact
FTA	Federal Transit Administration
FWSO	Federal WMATA Safety Oversight
HPCC	Hensel Phelps Construction Company
IFB	Invitation for Bid
IFP	Issued for Permit
IPP	Integrated Permit Package
LPA	Locally Preferred Alternative
MWAA	Metropolitan Washington Airports Authority
MWB	Maintenance of Way Building
NEPA	National Environmental Policy Act
NTP	Notice to Proceed
NTSB	National Transportation Safety Board
OCIP	Owner Controlled Insurance Program

PIP	Property Identification Plans
PMOC	Project Management Oversight Contractor
PMSS	Project Management Support Services
PMP	Project Management Plan
PPP	Public-Private Partnership
PRBS	Proposed Revised Baseline Schedule
QA	Quality Assurance
QC	Quality Control
QMP	Quality Management Plan
QPP	Quality Program Plan
RAMP	Real Estate Acquisition Management Plan
RCMP	Risk and Contingency Management Plan
RFMP	Rail Fleet Management Plan
RFQ	Request for Qualifications
RFQI	Request for Qualifications Information
RFP	Request for Proposal
RFI	Request for Information
RBS	Revised Baseline Schedule
RSD	Revenue Service Date
SCC	Standard Cost Category
SCWG	Safety/Security Working Group
SHPO	State Historic Preservation Office
SIB	Service and Inspection Building
SSCD	Schedule Substantial Completion Date
SSMP	Safety and Security Management Plan
SSOA	State Safety Oversight Agency
STOMP	Safety and Security Oversight Management Plan (TOC)
SWM	Storm Water Management
SWPPP	Stormwater Pollution Prevention Plan
TBD	To Be Determined
TBS	Tie-Breaker Station
TIA	Time Impact Analysis
TOC	Tri-state Oversight Committee
TPB	Transportation Police Building
TPSS	Traction Power Substation
TWF	Train Wash Facility
USDOT	United States Department of Transportation
VDOT	Virginia Department of Transportation
VSF	Vehicle Storage Facility
VSMP	Virginia Stormwater Management Program
WB	Warehouse Building
WFC	West Falls Church
WHB	Warehouse Building
WMATA	Washington Metropolitan Area Transit Authority

APPENDIX B – PROJECT OVERVIEW

Project Name: Dulles Corridor Metrorail Project – Phase 2
Grantee: Metropolitan Washington Airports Authority (MWAA)
FTA Regional Contact: Corey Walker, P.E. - FTA Region III, DC Metro Office Engineer
FTA Headquarters Contact: Dale Wegner, P.E. - FTA Headquarters, Project Manager

Scope

Description: Phase 2 of the Project consists of the design and construction 11.4 route miles of new track from the interim terminus at Wiehle-Reston East Station through Washington Dulles International Airport to a terminus in eastern Loudoun County. The current Phase 2 project budget is \$2,778,235,564 exclusive of parking facilities and finance costs. (Overall cost is 3.126 B.)
Guideway: Phase 2 consists of 11.4 miles of elevated and at-grade guideway.
Stations: Phase 2 includes six new stations (Reston Town Center, Herndon, Innovation Center, Dulles Airport, Route 606 and Route 772 Stations).
Support Facility: Phase 2 includes a maintenance and storage yard facility at Dulles Airport, wayside facilities (including traction power substations, tiebreaker stations, stormwater management ponds along the alignment), and five new parking facilities with 8,900 parking spaces.
Vehicles Phase 2 includes sixty-four new railcars.

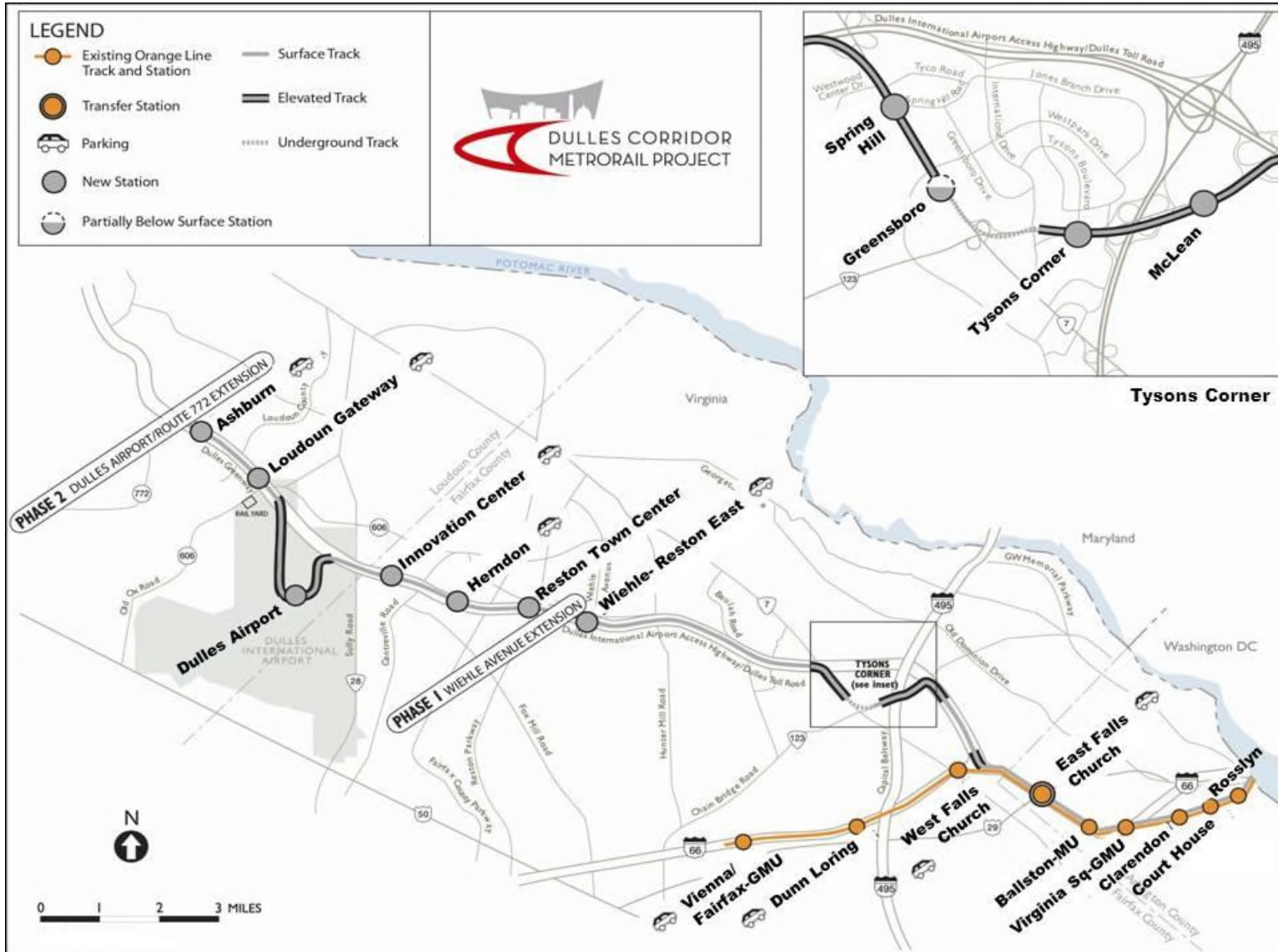
Current Delivery Milestone Schedule

12/01/2009	Preliminary Engineering Commenced
02/29/2012	Preliminary Engineering Completed
07/08/2013	Package A Design-Build NTP issued
11/18/2013	Package S Design-Build NTP issued
08/18/2014	Package B Design-Build NTP issued
05/08/2015	MWAA TIFIA Loan Executed
	Package S Completed
76%	Percent Work in Place Complete at the date of this report (<i>earned value</i>)
80.82%*	Percent Project Schedule Complete at the date of this report
	*Based on SSCD of August 7, 2019

Cost

\$2,778,235,564	Total project cost in year-of-expenditure dollars (\$YOE) at the date of this report
\$1,758,223,521	Amount of expenditures at the date of this report from a total project budget of \$2,778,235,564
72%	Percent Complete expenditures at the date of this report. (This percentage does not include finance charges and contingency)
\$324,571,235	Total project contingency remaining (allocated and unallocated contingency)

APPENDIX C – PROJECT MAP



APPENDIX D – MWAA SAFETY AND SECURITY CHECKLIST

Project Overview	Dulles Corridor Metrorail Project – Phase 2		
Project Mode (Rail, Bus, BRT, multimode)	Rail		
Project Phase (Preliminary Engineering, Design, Construction, or Start-up)	Design and Construction		
Project Delivery Method (Design/Build, Design/Build/Operate/Maintain, CMGG, etc.)	Design/Build		
Project Plans	Version	Review By FTA	Status
Safety and Security Management Plan	February 2016	Approved on June 16, 2016	MWAA submitted a revised SSMP on February 25, 2016 and PMOC provided comments to the FTA on March 28, 2016. MWAA’s email of April 13, 2016 stated they had no comments on the revised SSMP. FTA accepted the Plan with comments on June 15, 2016. The 2017 update was submitted on April 12, 2017 and PMOC recommended FTA approval on April 27, 2017. PMOC provided additional comments on June 1, 2017, requesting the FWSO be added to the Plan. The issue regarding the FWSO has been resolved and FTA’s letter of August 8, 2017 approved the revised plan.

<p>Safety and Security Certification Plan</p>			<p>MWAA has adopted their contractors' SSCPs as the guiding certification documents. MWAA Accepted "CRC's SSCP on October 10, 2014. MWAA accepted as noted HPCC's SSCP on February 20, 2015. The SSCP was resubmitted on May 28, 2015, and returned "Accepted as Noted" on July 2, 2015. HPCC resubmitted the SCPP on October 8, 2015 and MWAA "accepted as noted" on November 11, 2015. The SSCP was resubmitted on December 9, 2015 and accepted by MWAA on December 21, 2015.</p>
<p>System Safety Program Plan</p>	<p>January 2013</p>		<p>WMATA's 2014 SSPP is effective January 2014 and approved by TOC on April 25, 2014.</p>
<p>System Security Plan or Security and Emergency Preparedness Plan (SEPP)</p>	<p>3/2012</p>	<p>N/A</p>	<p>WMATA submitted a revised SEPP to TOC in March 2012, which the TOC approved on April 23, 2012.</p>

Construction Safety and Security Plan (CSSP)		CRC's CSSP was accepted on December 13, 2013. The CSSP procedures were submitted on June 4, 2014 for information. CRC's CSSP was resubmitted in January 2015 and accepted on February 5, 2015. APMC's CSSP was Accepted as Noted on December 23, 2014. HPCC's CSSP, Rev.1, was accepted by MWAA on December 15, 2014. The Procedures were accepted on March 5, 2015.
Safety and Security Authority	Y/N	Notes/Status
Is the grantee subject to 49 CFR Part 659 State Safety Oversight requirements?	Y	Tri-State Oversight Committee (TOC)
Has the State designated an oversight agency as per Part 659.9?	Y	Tri-State Oversight Committee (TOC)
Has the oversight agency reviewed and approved the grantee's SSPP as per 659.17?	Y	<i>WMATA's 2018 SSPP was approved by the FWSO on June 22, 2018.</i>
Has the oversight agency reviewed and approved the grantee's Security Plan or SEPP as per Part 659.21?	Y	WMATA SEPP approved on April 23, 2012.
Did the oversight agency participate in the last Quarterly Program Review Meeting?	Y	TOC and/or its contractor (TRA) routinely attend the quarterly meetings, including the most recent on June 4, 2018.
Has the grantee submitted its safety certification plan to the oversight agency?	Y	
Has the grantee implemented security directives issues by the Department Homeland Security, Transportation Security Administration?	Y	WMATA will be operator. TSA representatives participate in the monthly SCWG meetings.

SSMP Monitoring	Y/N	Notes/Status
Is the SSMP project-specific, clearly demonstrating the scope of safety and security activities for this project?	Y	MWAAs submitted a revised SSMP on February 25, 2016. FTA accepted the Plan with comments on June 15, 2016. The 2017 update, submitted on April 12, 2017 and PMOC recommended FTA approval on April 27, 2017. PMOC provided additional comments on June 1, 2017, requesting the FWSO be added to the Plan. SSMP, Revision 3 was approved by FTA on August 8, 2017.
Grantee reviews the SSMP and related project plans to determine if updates are necessary?	Y	
Does the grantee implement a process through which the Designated Function (DF) for Safety and DF for Security are integrated into the overall project management team? Please specify.	Y	
Does the grantee maintain a regularly scheduled report on the status of safety and security activities?	Y	
Has the grantee established staffing requirements, procedures and authority for safety and security activities throughout all project phases?	Y	
Does the grantee update the safety and security responsibility matrix/organizational chart as necessary?	Y	
Has the grantee allocated sufficient resources to oversee or carry out safety and security activities?	Y	

Has the grantee developed hazard and vulnerability analysis techniques, including specific types of analysis to be performed during different project phases?	N	Contractors (CRC and HPCC) are responsible for PHAs. A draft copy of the PHA was provided by CRC on June 25, 2014. CRC's Final PHA was submitted to MWAA on December 23, 2015. CRC began updating their PHA in early 2017 is expected to complete the review in the fourth quarter of 2017. HPCC's PHA was finalized on February 14, 2017. WMATA is responsible for TVA and selected a TVA Consultant in November 2016. The TVA consultant completed their TVA design review of Phase 2 on March 1, 2017.
Does the grantee implement regularly scheduled meetings to track to resolution any identified hazards and/or vulnerabilities?	N	CRC and HPCC will resolve all identified hazards and vulnerabilities with final review by the SCWG.
Does the grantee monitor the progress of safety and security activities throughout all project phases? Please describe briefly.	Y	Yes, through SCWG.
Does the grantee ensure the conduct of preliminary hazard and vulnerability analyses? Please specify analyses conducted.	N	MWAA is developing the PHAs through its contractors, CRC and HPCC, and WMATA is responsible for the TVA.
Has the grantee ensured the development of safety design criteria?	Y	
Has the grantee ensured the development of security design criteria?	Y	
Has the grantee ensured conformance with safety and security requirements in design?	N	The safety and security requirement conformance process is ongoing and a report will be issued at the end of the design phase.
Has the grantee verified conformance with safety and security requirements in equipment and materials procurement?	N	This requirement will be met through Construction Specification Conformance.
Has the grantee verified construction specification conformance?	N	The construction specification conformance process is in progress and a report will be issued at the end of the construction phase.
Has the grantee identified safety and security critical tests to be performed prior to passenger operations?	N	

Has the grantee verified conformance with safety and security requirements during testing, inspection and start-up phases?	N	
Does the grantee evaluated change orders, design waivers, or test variances for potential hazards and /or vulnerabilities?	Y	Contractor is responsible for this evaluation.
Has the grantee ensured the performance of safety and security analyses for proposed work-arounds?	N	
Has the grantee demonstrated through meetings or other methods, the integration of safety and security in the following: <ul style="list-style-type: none"> • Activation Plan and Procedures • Integrated Test Plan and Procedures • Operations and Maintenance Plan • Emergency Operations Plan 	N	
Has the grantee issued final safety and security certification?	N	
Has the grantee issued the final safety and security verification report?	N	

Construction Safety	Y/N	Notes/Status
Does the grantee have a documented/implemented Contractor Safety Program with which it expects contractors to comply?	Y	
Does the grantee's contractor(s) have a documented company-wide safety and security program plan?	Y	
Does the grantee's contractor(s) have a site-specific safety and security program plan?	Y	MWAA has accepted the contractor's Construction Safety and Security Plan.
Provide the grantee's OSHA statistics compared to the national average for the same type of work. If the comparison is not favorable, what actions are being taken by the grantee to improve its safety record?	Y	System in place, construction activities have started on Package A. Package B construction started in July 2015.
Does the grantee conduct site audits of the contractor's performance versus required safety/security procedures?	Y	MWAA has developed an Audit schedule. MWAA conducts audits every six months of the Construction Safety and Security and System Safety and Security for both Package A and Package B.

Federal Railroad Administration	Y/N	Notes/Status
If shared track: has grantee submitted its waiver request application to FRA? (Please identify specific regulations for which waivers are being requested)	N/A	This is a Heavy Rail Transit Project. There is no FRA involvement.
If shared corridor: has grantee specified specific measures to address shared corridor safety concerns?	N/A	
Is the Collision Hazard Analysis underway?	N/A	
Other FRA required Hazard Analysis – Fencing, etc.?	N/A	
Does the project have Quiet Zones?	N/A	
Does FRA attend the Quarterly Review Meetings?	N/A	

APPENDIX E – Top 10 Project Risks

RCMP - Top Ten Risks as of November 2017			
Risk ID	Event Description	Primary Risk Mitigation	Risk Rating
80.03.C.2	Request for Equitable Adjustment Part 2 (REA-2) (for changes included in CO-66 and for changes after CO-66 that have not been finalized) (Cumulative claims)	The notice of change was for information only and has not been submitted with an associated schedule in P6 native format for evaluation. Will review details once the native schedule file is submitted. (b) (5)	25
30.C. 185 NEW	Installation of gravity Sewer	Restratgeize the execution to ensure timely execution and dedicated crew to do this work.	25
80.03.C.243 NEW	Overall total cost claim by CRC	(b) (5)	21
80.08.C.196	WMATA does not provide adequate Vehicles availability, adequate and qualified staff to witness the test, and operators to complete testing, start-up or final acceptance in a timely manner.	1) Started tiger team meetings to coordinate needed efforts from all stakeholders. 2) Working with WMATA on lessons learned from Phase 1 which will be implemented on Phase 2 3) WMATA is retiring old rail cars so ample number of retired cars will be available to support the testing 4) Working with WMATA to utilize the WFC annex facility for repairs & maintenance which will minimize travel delays to Phase 2 site.	21
50.05.C.153	Communications System Scope of Work – Fire Alarm and Intrusion Alarm systems separation.	The designs for these changes have been finalized and the changes to construction have been reduced. Risk realized. Cost yet to be finalized. Negotiating to minimize cost impact, working with MEC to reduce schedule impact	20
80.03.C.3	Recovery of Revised Baseline Schedule (for changes post CO-66) (Acceleration of 109 days)	Working to avoid further impacts that may delay the schedule. (b) (5)	20
80.03.C.242 NEW	CRC subcontractors overhead claims	(b) (5)	20
20.02.C.1	Screenwall Glazing at Dulles Station	Currently in procurement for competitive bidding	20
80.R.112	Future WMATA (through its granted authority) requires changes to the scope post design or award to the DB.	The Project Team is to establish funding contingency for unanticipated or unforeseen WMATA actions impacting project(s) scope, and monitor/manage same in conjunction with DB and WMATA.	20
80.02.D.241	Repurposing of the TPB - Design	1) MWAA formally advised HP to cease procurement of specialized equipment and materials associated with the police function in the TPB. 2) WMATA to identify which design elements can be deleted or modified to meet WMATA's intended use of the facility. 3) Exclude the TPB from the contractual SSCD, but, complete the RTRA units in the building by ORD. 4) Exclude the TPB from the LEED Silver Certification.	20
30.01.C.244 NEW	Repurposing of the TPB - Construction	1) MWAA formally advised HP to cease procurement of specialized equipment and materials associated with the police function in the TPB. 2) WMATA to identify which design elements can be deleted or modified to meet WMATA's intended use of the facility. 3) Exclude the TPB from the contractual SSCD, but, complete the RTRA units in the building by ORD. 4) Exclude the TPB from the LEED Silver Certification.	20

* Proposed NEW item and Top Ten Risk

APPENDIX F – PMOC Evaluation Team

Michael Radbill, PE, F.ASCE, Program Manager

Mr. Radbill is responsible for oversight of this Task Order. He was assigned to this Task order at the end of March 2012 when he joined Hill. Mr. Radbill has over 40 years of technical and management experience in the construction of federal, state, local, and private projects, which types include public transportation, power generation, petrochemical, correctional, military, aviation, commercial, hotel, and others. Skills and management accomplishments include project manager for owner/contractor; analyzing and reporting on quality issues on FTA funded urban transit, and petrochemical construction projects; course designer and principal instructor for FTA sponsored project management course; instructor for FTA sponsored quality assurance/quality control (QA/QC) training course; reviewer for two FTA sponsored Guidelines; drafting and editing general and special conditions of the contract for FTA funded public transportation projects; lead civil field engineer for contractor on construction of fossil and nuclear power plants; developing, updating, and analyzing critical path method schedules; facilitating partnering for construction projects; testifying as an expert at trial regarding delays and damages; arbitrating construction disputes; writing and updating design and construction contracts and specifications.

Mathew Trzepacz, PE, Task Order Manager

Mr. Mathew Trzepacz, P.E., PhD, is responsible for oversight of this task order. He has over 40 years of experience in progressively responsible positions managing transportation design, maintenance, and construction. He has been the Project Manager for assignments in the FTA's PMOC Program in Regions 2, 4, and 8 for over eight years. He also developed the training manual and was an instructor for the National Transit Institute's course on the Management of Transit Construction Projects, which was established for the FTA. Mr. Trzepacz was previously responsible for a staff of professional engineers and maintenance forces as Chief Engineer for the Southeastern Pennsylvania Transportation Authority (SEPTA).

John Lehman, PE, Rail Equipment Engineer

John Lehman has over 35 years of experience in the transportation sector. Mr. Lehman has directed multi-disciplinary, multi-national engineering design teams on rail car manufacturing and large construction projects. He specializes in heavy equipment design, maintenance and operations, construction, and operations analysis for rail car procurement, rail manufacturing facilities and car repair and locomotive servicing facilities. Mr. Lehman has prepared engineering and economic studies on equipment selection, maintenance, transportation operations, and plant location.

Edward F. Nicholson, PE, Systems Integration Manager

Mr. Nicholson, P.E., has over 36 years of experience and has served as Senior Rail Planning Engineer, Superintendent of Signals, Communications, and Superintendent of Transportation for the Port Authority Trans-Hudson Corporation (PATH). During his employment at Hill, among other assignments, Mr. Nicholson

has performed PMOC oversight reviews and assessments on the Dulles Corridor Metrorail Project, Washington Metropolitan Area Transit Authority Projects, the Weber County Commuter Rail, and Mid-Jordan Projects in Salt Lake City, and the Central Florida Commuter Rail Project.

Judy R. Mewborn, CCM, Construction Management Manager

Ms. Mewborn has over 30 years of experience in the construction field performing such duties as capital program manager, senior project/construction manager, project control, facilities condition assessment, design management, surveying, planning, space programming, and the production of design and construction documents. Her experience also includes acting as a client representative Project Manager on federal and local government projects. Additional experience includes project management on educational, hospitality and commercial projects, as well as designer and project assistant on residential projects.